NOV.-DEC. 1987

FAA Aviation NEWS

A DOT/FAA FLIGHT STANDARDS SAFETY PUBLICATION

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U.S. Department
of Transportation

**Federal Aviation
Administration**

FAA Aviation NEWS

November/December 1987

Volume 26, Number 6

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FAA AVIATION NEWS is published by Flight Standards' Accident Prevention Program Branch, AFS-810, Federal Aviation Administration, Department of Transportation, Washington, DC 20591, in the interest of flight safety. The magazine is designed to promote safety in the air by calling the attention of general aviation airmen to current technical, regulatory, and procedural matters affecting the safe operation of aircraft. Use of funds for printing FAA AVIATION NEWS was approved by the Office of Management and Budget. All printed materials contained herein are advisory or informational in nature and should not be construed as having regulatory effect. The FAA does not officially endorse any goods, services, materials, or products of manufacturers that may be mentioned. **Certain details of accidents described herein are altered to protect the privacy of those involved.**

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BRIEFS

BY THE NUMBERS. The misuse of aircraft for drug smuggling has brought about several recent rule changes that affect the required display of aircraft information. Part 45 now requires all aircraft to have an externally mounted Data Plate, or to otherwise display serial and model numbers externally in a manner that is clearly legible from outside the aircraft, when that aircraft is on the ground or water. This will facilitate cross checking the information with the N-number. Compliance date is March 7, 1988.

Secondly, also beginning with this date, all aircraft penetrating U.S. air defense zones must display an N-number 12 inches high, or as large as practical within the authorized marking surface. The number may be affixed temporarily on aircraft which are authorized to use small numbers currently.

Finally, all aircraft modified with fuel tanks in a passenger or baggage compartment under Part 43 must carry on board a copy of FAA Form 337 which authorized that installation. Compliance date for this amendment is December 7, 1987.

FALL-OUT. The recent harrowing experience of a King Air captain--who fell out of his airplane doorway in flight and miraculously survived by clinging to the stairs--points out the danger of attempting to close doors aloft. Less fortunate were the Canadian pilots of a Twin Otter and a Piper Navajo who reportedly fell to their deaths while attempting to deal with door problems. In such circumstances there is always danger of being sucked outside as a result of the slipstream, a sudden turbulence, or abrupt autopilot disengagement. The safest course is to secure all occupants with seatbelts, reduce airspeed as appropriate and land at the nearest suitable airport. Open doors in flight are disturbing and may cause some control imbalance, but they should not interfere with a safe landing.

SECOND CHANCE. FAA has obtained evidence from state and Federal records concerning specified automobile traffic violations that were not reported on airman medical applications. Airmen who correct their records before January 1, 1988, will not be penalized, but may be evaluated to confirm eligibility for medical certification. After that date FAA will take enforcement actions as it becomes aware of any falsification. Send information to the Aeromedical Certification Branch, AAM-130, CAMI, Aeronautical Center, FAA, P.O. Box 25082, Oklahoma City, OK 73125.

Knowing Your Way Around the Airspace

PHOTO BY LARS GELFAN

The public concern over midair collisions, near-midair collisions and other flight mishaps attributed to erroneous navigation gives some people the impression that the sky has suddenly become overcrowded with aircraft. This prompts an outcry to impose greater limitations on airspace use, especially for private flying. The fact that general aviation flight activity has declined significantly over the past five years is usually overlooked.

On the other hand, the unprecedented expansion of air carrier service over the past decade—from about 275 million passengers per annum in 1978 to an expected 450 million in 1987—has significantly increased the volume of air traffic, particularly in major terminal areas. The air traffic system is fully capable of handling this increased volume safely. However, VFR pilots who do not use ATC services must depend primarily on their own visual alertness, and they must take a greater responsibility than ever before for accurate navigation if we are to deal successfully with the hazard of midair collisions.

Despite the increase in flight operations over the past 20 years, the number of midair collisions per year has remained constant at approximately 30 per year—making up less than 2 percent of all accidents. In recent years that figure has dipped as low as 12 midairs per year (1983). About 60 percent of midair collisions involve fatalities.

What gives some observers concern is the consistent increase in reported near midair collisons (NMAC's) in recent years. (A NMAC is an incident reported by a pilot or flight crewmember, stating that a collision hazard existed between two or more aircraft.)

The number of NMAC's rose from 311 in 1982 to 840 in 1986. Increased FAA emphasis on reporting potential flight conflicts and improvement in the reporting process have probably been factors in this disturbing NMAC increase.

Careful studies of these reports by FAA's Office of Aviation Safety show that most commonly these incidents occur in California, Florida and the Southwest, during the daylight hours of a clear day. About 93 percent of the time they involve at least one VFR pilot. NMAC's between IFR aircraft, which are provided separation by the air traffic service, are rare.

These problems do not appear to be the result of crowded airspace or bad weather but rather are a consequence of pilot failure to utilize the airspace system in the safest, most intelligent and appropriate manner. Some pilots regard all air traffic control measures as a time- and-money-consuming burden, and yearn for the freedom they associate with VFR flying in uncontrolled airspace, seldom used by the large air carriers.

UNCONTROLLED AIRSPACE

Such flying is still available in the United States—more so than in any other industrialized nation. But to engage in it safely you must be thoroughly aware of the appropriate airspace regulations and be equipped with appropriate charts and related aeronautical publications. In a sense, flying by reference to charts, VOR's and visual reference can be more demanding on individual alertness than IFR flying—insofar as the latter is supported by ATC services that include radar separation, vectors, clearances.

Airspace limitations and requirements are shown graphically on a variety of aviation charts, and also published as Federal Aviation Regulations, airport/facility directories, advisory circulars, etc. The appropriate publications must be accessible to pilots, who should be able to decipher all symbols on charts readily—without guesswork.

The tendency of many pilots to skimp on the completeness or currency of their essential flight literature is well known. We tend to hold on to outdated sectionals, for example, for years, assuming that "the basic information remains the same, and we can pick up the changes from a flight service station."

Well, sometimes we do, and sometimes we don't—and the consequences can be serious. Without our knowledge tall towers may be built near an airport, runways may be altered or placed under construction or closed; landmarks such as racetracks may be obliterated, etc., currency is vital. The safest policy is to order charts and supplements *on subscription.*

As a matter of fact, although most sectional charts are replaced every six months (others even less frequently), certain features presented on the charts, including low altitude military training routes, are subject to revision every 56 days. For this reason airmen are advised to look for such changes in the Airport/Facility Directory (also revised every 56 days) and to hand-alter their charts accordingly.

Passing an outdated chart or supplements on to a fellow pilot is not really an act of friendship. Non-current flight information is dangerous material and should be scrapped. The cost of maintaining current flight literature may seem high, but in fact navigational publications are sold at cost.

The average total expenditure of this kind over a year amounts to less that one percent of your annual flying expenses. You can regard it as a form of insurance against accidents.

Many pilots who fly on instruments whenever possible feel that it is unnecessary to carry VFR charts on the aircraft. This can be a harmful form of economy. If for some reason you have an electrical failure in flight or for any other reason have to go off the instruments and make an emergency landing, you may have to do a lot of "groping and guessing" without VFR charts.

Selection and maintenance of the essential navigation literature is an important pilot responsibility. Any flight mishap that is even partially due to pilot unfamiliarity with the airspace, or its boundaries or restrictions, points a finger at pilot error.

VFR charts provide many kinds of information. Their primary intention is to assist pilots in determining position (by visual reference); to define controlled and uncontrolled airspace where different weather minimums apply for VFR flight; and to depict restricted or prohibited areas. The airspace over all U.S. territory, extending to three miles out over the ocean and up to infinity, is "controlled" in that its usage is determined by the FAA. The safety of the airspace and the surface area beneath it is governed in accordance with Federal Aviation Regulations, which establish standards of aircraft airworthiness, pilot competency, and operational safety—as well as air traffic procedures.

The concept of "uncontrolled airspace" is used on charts and in rulemaking to refer to that portion of the airspace where the *Air Traffic Service does not have authority or responsibility to exercise control over air traffic.* In uncontrolled airspace you, as the pilot, have no requirement to contact any traffic control facility, and the air traffic service has no responsibility for separating aircraft in flight from each other, or from ground obstacles.

Furthermore, in that portion of the uncontrolled airspace which lies at or beneath 1,200′ AGL (above ground level) you may operate under Visual Flight Rules as long as you have at least one mile of flight visibility and remain clear of clouds. In uncontrolled airspace higher than 1,200′ AGL, the one mile flight visibility provision remains in effect, but you must be able to keep a distance of 2,000 feet laterally from any cloud, 1,000 feet above clouds, and 500 feet below. (In controlled airspace the cloud clearance distances for VFR flight are the same, but the minimum visibility is three miles.)

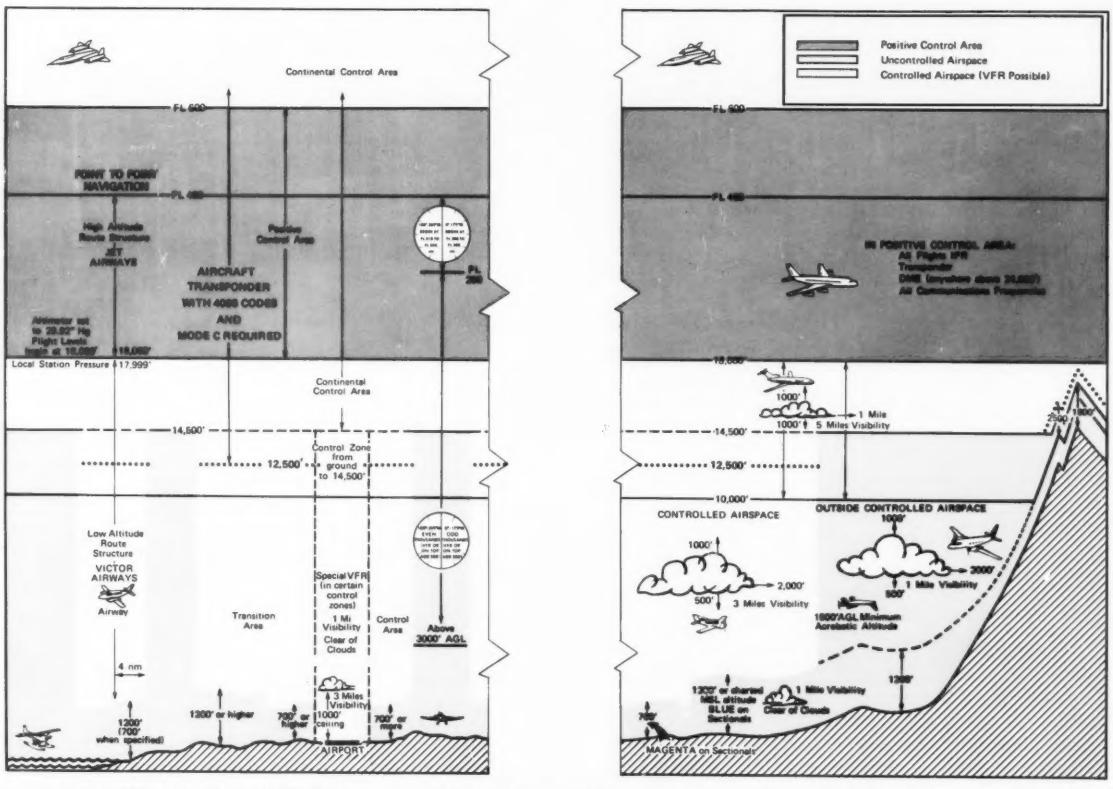
Where is uncontrolled airspace? It begins at the surface and extends laterally over the entire country except where (as indicated on VFR charts) *some form of controlled airspace has been established.* The minimum

Floor 700 feet above surface – – – – –

Floor 1200 feet above surface – – – – –

ceiling of a body of uncontrolled airspace is 700′ AGL, as indicated by a broad, shaded magenta line, with the tint fading toward the direction of the enclosure. A blue shaded line marks off uncontrolled airspace

Airspace Utilization Plan



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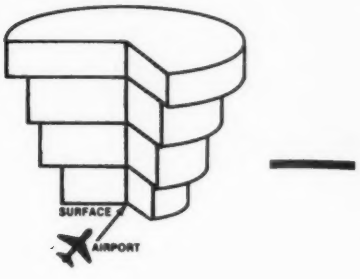
with a ceiling of 1,200′ AGL, unless a numerical figure on the chart indicates a higher ceiling. Beyond the sharp edge of the blue shaded line (unless it adjoins a magenta shaded line) you may have uncontrolled airspace extending up to a maximum ceiling of 14,500′ MSL. Over very high mountainous terrain this ceiling may be pushed up as high as 16,000′ MSL.

All of the airspace that overlies uncontrolled airspace is *controlled* airspace. There are also significant blocks of controlled airspace which interrupt the lateral extent of uncontrolled airspace. VFR flight in controlled airspace requires at least a three mile visibility, plus the same cloud clearances required for uncontrolled airspace above 1,200′ AGL. There are also many operational restrictions, as well as air traffic services, in controlled airspace.

Controlled airspace is shown pictorially or symbolically on sectional charts, as follows:

Terminal Control Area is indicated by a pattern of blue lines around major airports, approximately ⅛″ thick and more or less concentric in design. The TCA has been described as looking like an upside down wedding cake. There are three or more layers, beginning at the surface and widening laterally as they go up. Some TCA's will extend as far as 30 statute miles from the primary airport. The ceiling may be as high as 12,500′ MSL. The ceiling and floor of each layer is shown in blue numbers, indicating hundreds of feet MSL.



The purpose of a TCA is to enable air traffic control to identify, locate and control all aircraft movements within a busy terminal area—and thus avoid conflicts and reduce delays. Without ATC approval aircraft are not permitted to *transit* a TCA. Operation within a TCA requires air traffic control clearance, two-way radio, and a functioning transponder with altitude encoding capability (with some exceptions). Student pilot operations are barred in 9 of the 23 TCA's now functioning. Additional TCA's are under consideration.

For the most part VFR pilots must relate their position to TCA airspace by means of ground reference. It is essential that this navigation be precise—not only for using airports within or beneath the TCA structure but also for preventing inadvertent penetration of a TCA layer and possible conflict with arriving or departing traffic.

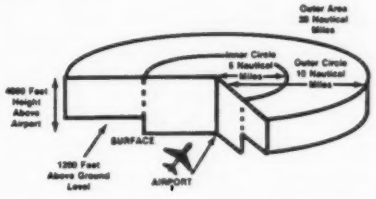
VFR pilots operating beneath the floor or above the ceiling of a TCA should leave a sizable buffer of airspace between their flight path and the imaginary line of demarcation—as a safety margin against the possibility of altimeter or navigation error. In this connection, if you have a transponder on and are squawking Mode "C" (altitude reporting signal), this may greatly assist air traffic controllers in assuring safe traffic separation, without requiring any radio transmission on your part. (Transponder signals without Mode "C" from aircraft not being tracked by ATC may be disregarded.)

> As of December 1, 1987, Mode C equipment will be required in all aircraft flying into any one of the 23 Terminal Control Areas at the nation's larger airports. Previously, Mode C has only been required at the nine larger TCA's.

Arrival and departure patterns for heavy air carriers, military aircraft and other large or turbine powered aircraft are usually indicated on TCA charts. The best navigation instruments for collision avoidance are a sharp eye and a current VFR Terminal Area Chart.

These charts represent a 100% enlargement of the airspace shown on a sectional chart. This permits far greater accuracy in relating physical features of the landscape to the graphic displays, and in measuring distances. Clutter is reduced, and details which would be difficult to find, or even impossible to present on sectionals, may be seen clearly on the Terminal Area Charts. A bluelined rectangle on the sectional charts indicates the area covered by the terminal chart.

An ARSA (Airport Radar Service Area) is a double-tiered circular block of airspace, with a normal upper limit of 4,000′ AGL. It is delineated on existing VFR charts with slashed blue lines, enclosing the primary airport. The blue lines will be replaced with magenta on all upcoming sectional and TCA charts—to reduce any confusion about boundaries between TCA's and ARSA's.



Pilots are required to establish two-way communications with ATC prior to entering the ARSA, and while operating within the ARSA. Radar services include traffic sequencing to the primary airport, separation between IFR and VFR aircraft, and traffic advisories and safety alerts. Although not mandatory, pilot participation is encouraged within 20 miles of the primary ARSA airport.

TRSA's (Terminal Radar Service Areas), shown on VFR charts as a solid magenta line, are also a two-tiered design, enclosing a busy terminal area. Radar advisories and sequencing, as well as separation service, are available to VFR pilots. Pilot participation is urged, but not mandatory.

Airport Traffic Areas (ATA's) include the airspace within five statute miles of an airport with an operating control tower, extending up to, but not including, 3,000 feet AGL. An airport with a control tower is shown in blue on VFR charts, with the hours of operation (if less than full time) displayed close by. Boundary lines are not shown.All aircraft operating within an Airport Traffic Area are required to maintain two-way radio contact with the tower and to comply with ATC advisories for an orderly flow of traffic and for arrival/departure sequencing.

Special Air Traffic Rules airspace lies within a terminal area where certain conditions of environment or traffic flow have led to the enactment of specific regulations, under FAR Part 93. The pertinent information will be given on the chart or may be found in the appropriate Airport/Facility Directory volume. The chart symbol is a blue box around the airport name.

A Control Zone is a block of controlled airspace enclosing a terminal area, with at least one airport in the CZ having an instrument approach procedure. The CZ is shown on VFR charts as a segmented blue line, either in the shape of a circle or a keyhole. Its purpose is to assist air traffic control in

providing traffic separation in IFR conditions. Usage is continuous, unless otherwise indicated on charts and supplements. Aerobatics are prohibited.

A Control Zone, above the limits of any existing Air Traffic Area, may be penetrated by VFR pilot in transit without contacting the controlling agency (tower, center or FSS) as long as VFR conditions for controlled airspace can be maintained—3 miles visibility, with distances to the nearest clouds no less than 2,000′ laterally, 500′ below and 1,000′ above.

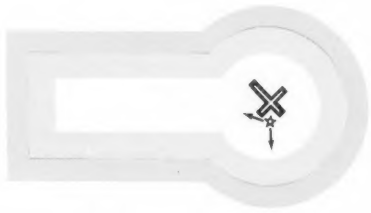
If a VFR pilot wishes to land at or depart from an airport within a Control Zone, the same VFR visibility and cloud clearance minimums apply, plus a distance of at least 1,000′ between the surface and any reported cloud ceiling, When the reported weather is below VFR minimums you may request a "Special VFR Clearance" from the agency governing the control zone. SVFR implies that you shall remain clear of clouds. When granted, you will be provided separation from IFR traffic within the Control Zone, and given vectors or instructed to make position reports while in the zone.

SVFR is granted on a workload permitting basis, and is not available for fixed wing aircraft at certain busy airports (where the zone demarcation line is marked with "T"s). At night SVFR may be granted only if the aircraft is instrumented, and pilot appropriately qualified, for instrument flight.

When an official weather observation exists for a Control Zone, the reported ceiling applies to all airports located within the zone, regardless of local conditions. (A "ceiling" is a weather phenomenon which can be determined only by an official observer.) At airports where no official visibility observation is available, pilots may determine flight visibility for themselves. If there is no current weather observation for a Control Zone, pilots may operate VFR as long a they can maintain VFR visibility minimums and distances from clouds applicable to controlled airspace.

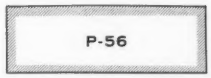
VOR Airways, indicated by extended blue lines, are based on a centerline between NAVIADs or intersections of their signals. Each airway is identified by a number (example: V 304), and by the outbound radials from a VOR. The enclosed controlled airspace extends laterally four miles to either side, with the floor at 1,200′ AGL and the ceiling at, but not including, 18,000′ MSL. Over Hawaii, however, there are no upper limits.

Transition Areas consist of controlled airspace that extends upward from 700′



AGL or higher, in conjunction with an airport having approved instrument approach procedures; or from 1,200′ ALG or higher, in conjunction with airway route structures or segments. Unless otherwise specified, transition areas terminate at the base of the overlying controlled airspace.

SPECIAL USE AIRSPACE is an area wherein flight activity may be prohibited entirely, or where activities take place "must be confined because of the nature or where limitations are imposed on aircraft operations which are not part of these activities." Details including time of use, altitudes, communications, controlling agencies, etc., are found on the tabular panels of the chart or in some cases adjacent to the marked-off area. Controlled airspace weather minimums apply. Special Use Airspace is symbolized by blue hash marks within a blue box or circle—except for Military Operations Areas (MOAs), which are shown by a magenta box and hash marks.



Prohibited Areas are designated in the interests of national security and welfare. Examples include the permanent habitations of the President and Vice President, plus certain fixed sites, such as the Government Mall in Washington, D.C.; or national shrines, like Mt. Vernon, VA. The airspace is marked with a blue rectangle or circle and the letter "P" with an identifying number.

Aircraft may not be operated in this airspace without prior authorization from the controlling agency (identified in the tabular panels).

Wherever a top official has a scheduled appearance (political conventions, dedication ceremonies, etc.), temporary restrictions may be established by the ATC for the area. Pertinent aeronautical information is provided by Notices to Airmen (NOTAMs), available from the nearest FSS.

A Restricted Area denotes airspace containing activities considered to be hazardous to non-participating aircraft. Prior authorization to penetrate the area must be obtained from the controlling agency, as indicated on the chart.

A Warning Area is airspace over international waters containing activity that may be hazardous to non-participating aircraft. Since a Warning Area is located outside of the national airspace (usually over an ocean); it is not legally possible to restrain non-participating aircraft.

Military Operations Areas (MOA's) may contain intensive flight training or other military activities at any time. Civilian aircraft are not prohibited from entering the area, but careful attention should be paid to the appropriate notation on the chart concerning altitudes and times of use.

OTHER FORMS OF AIRSPACE

Air Defense Identification Zone (ADIZ). These areas are established (from the surface up to infinity) outside the coastal waters of the United States, for purposes of early identification of inbound aircraft. Pilots of VFR aircraft must file a VFR flight plan in person, or by telephone, at least one hour before penetration. Note that an air-filed VFR flight plan makes the aircraft subject to interception by U.S. military jets for positive identification. An operable two-way radio is required for a flight in an ADIZ. Blue dots (instead of hash marks are shown inside the line of demarcation.)

Military Training Routes (MTR's). These are narrow grey or brown lines marked VR (for VFR flight) or IR (IFR), followed by a route number. A four-digit number is used for MTR's which are conducted entirely below 1,500′ AGL. Three-digit routes may be active above or below 1,500′ AGL. The route widths vary, and may extend for several miles to either side of the line shown. Any FSS within 100 miles may be contacted in advance for information about route widths and times of activity. Military jets may operate at speeds of 540 mph at very low altitudes with camouflage designs that make traffic identification difficult.

ENVIRONMENTALLY SENSITIVE AREAS

Except in officially designated areas, aircraft are prohibited from taking off or landing on charted territory administered by the National Park Service, U.S. Fish and Wildlife Service, and the National Forest Service. Pilots are requested to maintain an altitude of at least 2,000′ above the surface.

FAA Advisory Circular 91–36C, "VFR Flight Near Noise Sensitive Areas," defines the surface as: "the highest terrain within 2,000 feet laterally of the route of flight, or the uppermost rim of canyon or valley."

The areas are delineated on sectionals with a solid blue line, with blue dots on the side of the enclosure. Local jurisdictions may have similar rules or policies, not shown on the sectionals but available from FSS's or local authorities. ■

Copies of "Flight Operations in the National Airspace," a new 16mm film produced by the Air Safety Foundation, have been purchased by FAA for local showing to pilots. Consult your Accident Prevention Specialist.

VFR Aeronautical Charts and Supplements

What they cover, when they come out; what they cost

Aeronautical charts and related publications, produced for FAA through the National Ocean Service (NOS), are available from the NOAA Distribution Branch, N/CG33, National Ocean Service, Riverdale, Maryland 20737.

Navigation publications and charts may also be ordered directly from sales agents located at airports, or from any of the three regional NOS locations, as indicated below. To avoid delay, use a copy of the order form (see page 10).

Northwest:
1801 Fairview Ave., E.
Seattle, WA 98102
Phone: (206) 442-7657

Mid-Atlantic:
439 West York Street
Norfolk, VA 23510
Phone: (804) 441-6616

Alaska:
701 C Street
Anchorage, AL 99513
Phone: (907) 271-5040

A 24-hour customer service toll-free "800" telephone number is available for leaving recorded messages concerning subscription problems with the main office: (800) 638-8972.

Publications are shipped via United Parcel Service, first class mail or priority package within the United States. For addresses in other countries, please add 10 percent to the total cost of your order for foreign surface shipment. Write for a transportation cost quotation is you require faster foreign delivery. All orders must include a check or money order payable to NOS, Department of Commerce, N/CG33. Remittance must be in U.S. funds; that is, by check payable on a U.S. bank, or by international money order.

AERONAUTICAL PLANNING CHARTS

Aeronautical planning charts are used for pre-flight planning of long, transcontinental flights. Selected routes may be transferred to more detailed charts for actual inflight use.

The VFR/IFR "Wall" Planning Chart	
(Scale 1 inch = 32 nmi).	
One year subscription	$45.50
Single Copy	$ 6.50

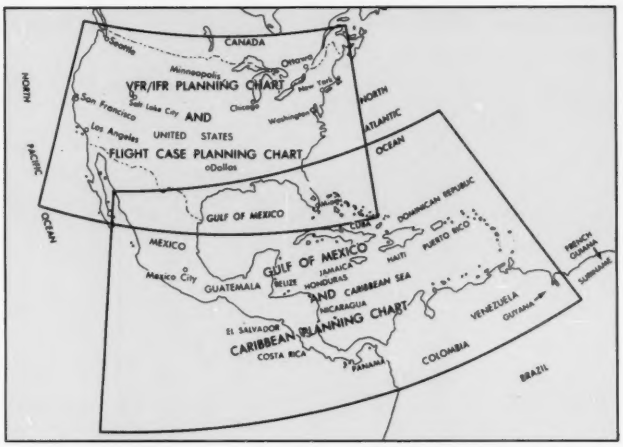
This is a large (82" by 56"), flat chart produced in two pieces, which can be assembled to form a composite VFR planning chart on

one side and an Instrument Flight Rules (IFR) planning chart on the other. Information on the VFR chart includes cities and towns, large bodies of water, major drainage patterns, shaded terrain relief, navigational facilities, airports, special use airspace areas and military training routes.

The IFR side depicts low altitude airways and mileages, navigational facilities, special use airspace areas, time zones, airports, isogonic lines and related data. The Wall Planning Chart is revised each 56 days. This chart is shipped unfolded unless you request a folded set.

The Flight Case Planning Chart
(Scale 1 inch = 60 nmi)
Two year subscription $14.40
Single copy ..... $ 3.60

This small-scale, folded chart is designed for pre- and in-flight planning. Sheet size is 30″ by 50″. It includes basically the same information as the VFR/IFR Wall Planning Chart with the addition of selected Flight Service Stations (FSS) and National Weather Service Offices located at airports; also parachute jumping areas, a tabulation of special use airspace areas, a mileage table listing distances between 174 major airports, and a city/airport location index. The Flight Case Planning Chart is revised each 24 weeks.



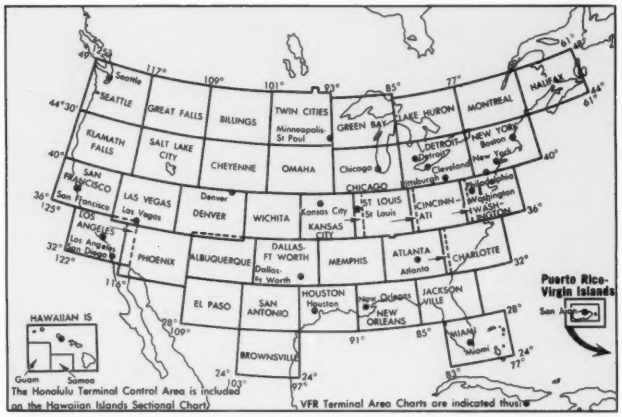
Planning Charts for the United States, Gulf of Mexico and Caribbean Areas

SECTIONAL AND TERMINAL CHARTS

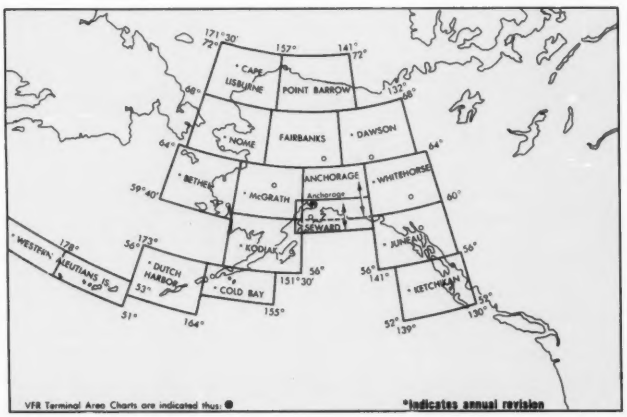
Sectional Aeronautical Charts
(Scale 1 inch = 6.86 nmi, 20″ by 60″, folded to 5″ by 10″, 55 charts)

To order, designate the name and series

Example	*Single copy*	*2-year Subscription*
Washington Sectional	$5.00	$20.00
Annually Revised Alaska Sectionals	$2.75	$ 5.50



Sectional and VFR Terminal Area Charts for the adjacent United States, Hawaiian Islands, Puerto Rico and the Virgin Islands



Sectional and VFR Terminal Area Charts for Alaska

Sectional Aeronautical Charts are the navigational maps most commonly used by VFR pilots, especially for short range flight at low altitudes. The "sectionals" give you the largest picture of en route airspace and terrain. They also give you the most complete detail.

All landforms are accurately depicted and contoured, and every conceivable detail that might be of interest to a pilot is shown. This includes rivers and bodies of water, as well as roads, railroads and other recognizable landmarks, such as race tracks, outdoor movie theaters, distinctive buildings, dams, etc. All airports are shown, military, public and private, as well as all navigational aids, known flight obstructions, low altitude airways, military training routes, special use airspace, flight service stations, control towers, and all boundaries of controlled and uncontrolled airspace.

The only drawback to sectionals is the need to cross over from one to another in flight, if your trips extends beyond its borders. There are 39 sectionals for the adjacent 48 states, Hawaii and Puerto Rico/Virgin Islands; they are published every six months. There are 17 sectional charts for Alaska—some of these are published annually. All charts are designated by the names of the largest city in the area covered.

PLACE
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ASSISTANT PUBLIC PRINTER

(Superintendent of Documents)

Government Printing Office

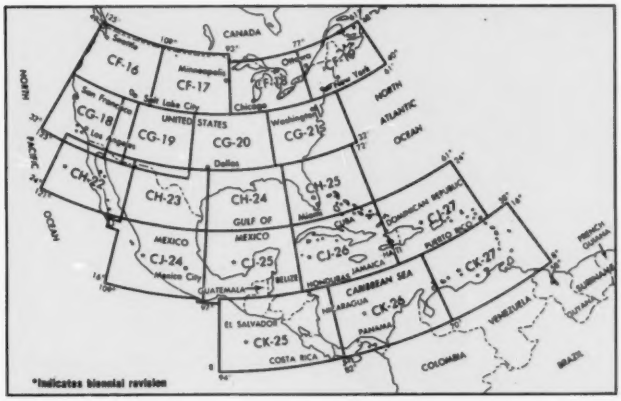
Washington, D.C. 20402

Terminal Area Charts

Example	*Single copy*	*2-year Subscription*
Atlanta VFR Terminal	$2.75	$11.00
Puerto Rico-Virgin Islands VFR Terminal	$5.00	$10.00

These are a 100% enlargement of a portion of a sectional. They provide a large scale presentation of each of the 23 currently existing Terminal Control Areas around major airports (9 additional TCA's are under consideration).

These charts are important to many pilots who do not fly in a TCA but have occasion to navigate around, over or under it. The large scale is important for precise VFR navigation with reference to ground features, in order to assure separation from TCA traffic.



World Aeronautical Charts for the adjacent United States, Mexico, and the Caribbean Areas

Gulf of Mexico and Caribbean Planning Chart
(Scale 1 inch = 86 nmi)

This VFR planning chart is on the reverse side of the Puerto Rico/Virgin Island VFR Terminal Area Chart. Information shown includes mileages between airports of entry, a selection of special use airspace and a directory of airports with their available facilities and servicing. This chart is revised annually.

VFR Flyway Planning Chart

The reverse side of the Dallas, Houston, L.A., Miami, and San Diego Terminal Area Charts contain a special chart which identifies VFR flyways designed to help VFR pilots avoid major traffic flows. It also shows multiple VFR routings throughout the TCA coverage which may serve as alternates to flight within the terminal control area. The ground references also provide a guide for improved visual navigation. For *planning only*, not intended for inflight navigation.

World Aeronautical Charts
(Scale 1 inch = 13.7 nmi, 20 inches by 60 inches, folded to 5 inches by 10 inches)
To order designate the series and chart number; e.g., WAC–CH25

Two year subscription	$10.00
One time sale	$ 5.00

World Aeronautical Charts (WAC's) may be preferable to sectionals for longer flights, since they cover twice the distance of sectionals and require less handling in the cockpit.

WAC's also provide coverage outside of the United States. Basically these charts cover the same features as the sectionals, although some details will be left out or abbreviated. The limits of controlled airspace, for example, are not included.

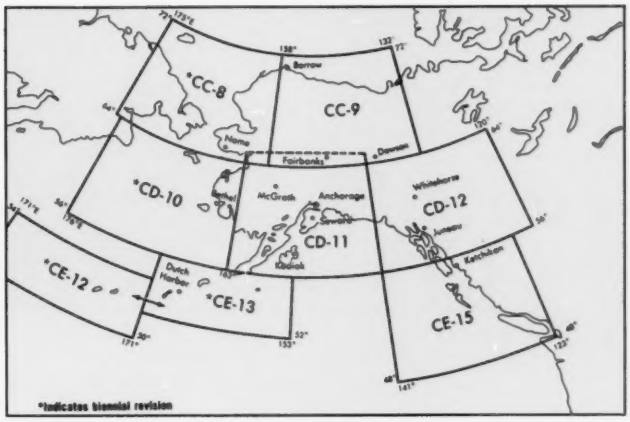
Also, because of the smaller scale, detail "clutter" may be somewhat more objectable in some congested areas, and navigation by reference to the ground more difficult.

There are 13 WAC charts for the adjacent 48 states and Mexico, 6 charts for Central America, and 8 charts for Alaska and the northern Pacific Ocean. The charts are revised biennially, except for those in the far north and in Central America, which are revised as needed.

SUPPLEMENTARY PUBLICATIONS

Airport/Facility Directory

The Airport/Facility Directory is a pilot's manual which contains data on airports, seaplane bases, heliports, navigation aids, com-



World Aeronautical Charts for Alaska

Airport/Facility Directory Areas of Coverage

munications, special notices, and operational procedures. The seven volumes cover the adjacent United States, Puerto Rico, and the Virrgin Islands. The Airport/Facility Directory includes data that cannot be readily depicted in graphic form; e.g., airport hours of operation, types of fuel available, runway widths, lighting codes, etc. The Directory also provides a means for pilots to update visual charts between edition dates; i.e., it is published each 56 days while most Sectionals and Terminal Area Charts are revised each six months.

Subscriptions (one year)
Adjacent U.S.-full 7 volume set $74.00
One volume $14.00
Each additional volume (same subscriber) $10.00
Single sets (one time only)
Adjacent U.S.-full 7 volume set $14.00
Single copies
Each book ..... $ 2.00

Subscription Policy: Additional books of the A/F Directory may be added to an existing subscription at any time during the subscription year. All books added to the basic subscription in this manner will expire with the basic subscription (subscription expiration dates will not be adjusted). An existing subscription address label must be included when ordering. If ordering by phone, please provide subscription number and expiration date. The charge for additional books will be computed on an annual basis only (no prorated charges for a portion of a subscription year).

Supplement Alaska
Annual subscription $15.00
One time sale ..... $ 2.75
(single copies are also available from any Alaska Flight Service Station)

The Supplement Alaska is a joint civil/military flight information publication issued by the National Ocean Service each 56 days. It is a single volume designed for use with the VFR charts. The Supplement Alaska contains an airport facility/directory, airport sketches, communications data, listings of navigational facilities, and special notices and procedures.

Pacific Chart Supplement
Annual subscription
(includes amendments) $30.00
One time sale ..... $ 5.00

This Supplement is published each 56 days. It is designed for use with Flight Information Publication Enroute Charts and with the Sectional Aeronautical Chart covering the state of Hawaii and that area of the Pacific served by U.S. facilities. Included are an airport/facility directory of all airports open to the public and those requested by appropriate authority, communications data, navigational facilities, special notices and procedures applicable to the Pacific area.

Instrument approach procedure charts, standard instrument departure charts, standard terminal arrival charts, airport diagrams, radar minimums, and supplementary supporting data for the Hawaii and Pacific Island are included in this supplemental. An Amendment Notice is published 4 weeks after each issue.

U.S. Gulf Coast VFR Aeronautical Chart
(Scale 1:500,000)
One time sale $3.35

This chart is designed primarily for helicopter operations in the Gulf of Mexico area. Information depicted includes offshore mineral leasing areas and blocks, oil drilling platforms, and high density helicopter activity areas. This chart is revised annually.

VFR Helicopter Chart of Los Angeles and Vicinity
(Scale 1:145,827)
One time sale $2.25

This chart shows principal helicopter routes in the Los Angeles area. The chart is revised on an "as required" basis.

Airport Obstruction Charts (OC)
One time sale $4.50

The Airport Obstruction Chart (OC) is a 1:12,000-scale graphic showing airport obstruction information, FAR Part 77 surfaces, runways, taxiway and apron areas, air navigation facilities, and selected planimetric detail. The OC provides data for computing maximum take-off and landing weights, for establishing instrument approach and departure procedures. and for engineering studies relative to obstruction clearing and improvements in airport facilities.

CATALOG OF CHARTS

A free catalog describing aeronautical charts and related publications, with prices and instructions for ordering, is available from the National Ocean Service, 6501 Lafayette Avenue, Riverdale, MD 20737.

VFR Chart User's Guide
(8½ by 11 inch, 36 page, multi-colored booklet)
One time sales $4.00

The VFR Chart User's Guide is intended to serve as a learning aid to understanding the wealth of information found on NOS visual aeronautical charts. Enlarged drawings present a clear view of the various symbols shown on charts. Associated publications, such as planning charts and the Airport/Facility Directory, are also briefly described. A **NOAA Aeronautical Chart User's Guide** will replace the VFR Chart User's Guide in the spring of 1988 and will include information of IFR charts as well.

Included are comprehensive examples of the symbols used on VFR charts. ■

This article was produced with the aid of the Cartographic Standards Section, National Flight Data Center, Air Traffic Operations Service, which initiates and maintains surveillance on the cartographic features of the maps.

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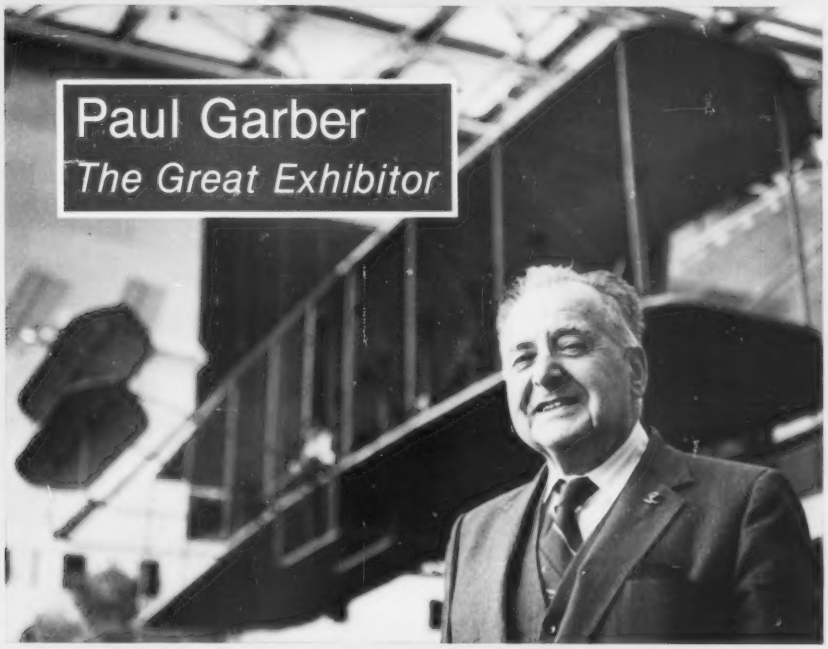

Paul Garber
The Great Exhibitor

He only had a three month appointment as a preparator in the Smithsonian's Arts and Industry Museum (Mechanical Division). So far he had helped repair and prepare for display guns, bicycles, the first example of a dial telephone, and even a suit of armor. But none of these things would leave its mark when he left as being his project. Then his boss went on vacation, and he knew this was his chance to work on a project close to his heart.

With the help of the Smithsonian's Librarian, he found the design details of DaVinci's 15th century ornithopter. In between other assignments, he built a scale model of this early wing-flapping, manpowered aircraft. He put in overtime to get everything completed. Near the end of his last day, he installed a hook in the museum's ceiling and carefully hung his model. As he was putting on the finishing touches, an elderly gentleman came over to see what he was doing. After discussing the model for awhile, the gentleman wandered away and the young man continued his task.

Moments later the museum curator came over. The young man figured he was in trouble, so he said he was just getting ready to leave. To his surprise the curator started questioning him on his Civil Service status and asked if he would like to continue with the Smithsonian. It seems that the elderly gentleman was the Secretary of the Smithsonian, and he had been impressed by the young man's aviation knowledge. Today, sixty-seven years later, this man is still with the Smithsonian and still impressing us with his aviation knowledge and youthful excitement. His name is Paul Garber, Historian Emeritus of the National Air and Space Museum.

Born on August 31, 1899, in Atlantic City, NJ, Paul Garber's introduction to aviation was a kite given to him as a gift in 1904. He has never forgotten the thrill of feeling the wind tug at his outstretched arms, trying to lift him into the sky. Five years later a chance encounter in Washington, DC, led to his first glimpse of a flying aircraft.

Paul Garber's father, an art dealer, decided to move his business to the Nation's Capital. So in 1909 he came to search around the city for a gallery location, and brought along his son, who would soon be ten.

Young Paul was reading one of the Washington newspapers when the announcement of a flight demonstration caught his eye. Bringing it to his father's attention, he eventually gained permission to go after lunch and see it on his own. With 50¢ in hand he made his way on the rail line to Ft. Myers, VA (near Arlington Cemetery). As he got off the train he heard a strange sound. Looking up he saw something which had the shape of a huge box kite, but two men were sitting in the framework and there were two propellers rotating.

As the flying machine turned away from him, he started to run, eventually joining up with the watching crowd. Years later Garber would realize and appreciate the distinguished group of aviation pioneers who were gathered there and watching with him. What he had witnessed was the July 27, 1909, endurance flight the Wright brothers put on for the U.S. Army. Orville and Wilbur were proving their *Flyer* could meet the U.S. Army specifications by staying in the air for one hour with two men on board. A few days later the distance portion of the test would be flown.

Soon afterwards Paul Garber's family moved to Washington, where he continued his interest in flight by organizing model airplane and kite clubs among his schoolmates. By the time he was 16 he had made and flown a biplane hang glider. He went on to study aeronautical engineering at the University of Maryland in College Park.

With the coming of World War I, Garber's engineering studies were cut short. By the end of the war he had obtained the rank of sergeant in the Army. He had also started flight training, but the Armistice was signed in 1918 before he soloed. Wanting to stay in aviation, Garber started his new job with the Postal Service Air Mail at College Park as a member of the ground crew.

Soon Paul and some friends bought a military surplus airplane—his 1/10 share cost him $50. Between his airplane partners and the Postal Service pilots, Garber eventually learned to fly and soloed on July 1, 1919. By the next year Paul left the Postal Service (the expense did not justify the run and would be discontinued in 1921) and took a temporary job with the Smithsonian which, thanks to his ornithopter model, became permanent.

Garber continued his work as a preparator and built more airplane models (Henson's and Cayley's for example). He also spent much of his time convincing his superiors of the importance of obtaining aviation artifacts, airplanes in particular. In May of 1927, while Lindbergh's *Spirit of St. Louis* was droning its way over the Atlantic, Paul Garber pulled off what he considers one of his best acquisitions for the Smithsonian. When Lindbergh arrived in Paris, he found a telegram from the Smithsonian (signed by the Secretary, but written by Garber) requesting that the historic aircraft become part of the Museum's display. After touring the country for a year, the "Spirit" wound up in Garber's hands.

In 1931 Paul Garber was made Assistant Curator for the Aeronautics Section, spurring him on to obtain even more historic aircraft. World War II saw Garber again in military service, this time as head of the U.S. Navy's Special Devices Division, Aeronautics Branch. He spent most of his time developing ship-to-air gunnery target kites and producing scale models for enemy aircraft identification.

Garber returned to the Smithsonian after the war, and was appointed the first Curator of the National Air Museum when it was established by an Act of Congress in 1946. It was through his efforts that Orville Wright agreed to allow the Wright's 1903 *Flyer* to be brought back to the U.S. in 1948 after a 20 year exhibition in England. However, getting it to Washington, DC, was another matter. The aircraft was shipped to Halifax because of a dock strike in the United

(continued on back cover)

Flight Testing Homebuilts

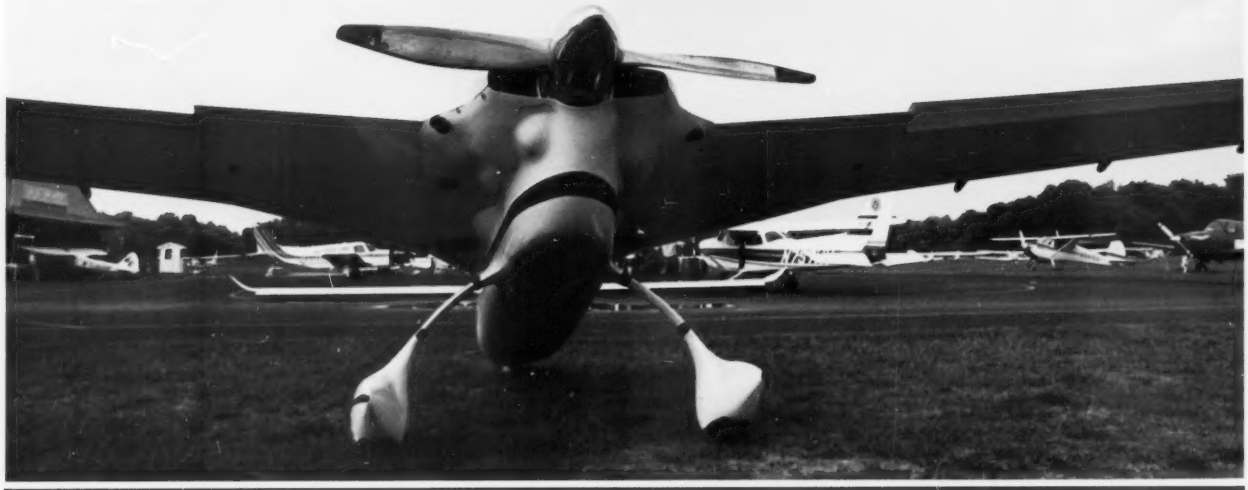

PHOTO BY LARS GELFAN

On any given day several hundred, perhaps thousands, of homebuilders in this country are working hard in basements, garages, or workshops creating the ultimate personal enterprise—an airplane. Most of these proud creations will be completed in due time and will become a source of great pride to their owners. But sadly—and unnecessarily—some of these aircraft will not survive their test flight phase.

From January 1980 to May 1987 there were 1,974 reported amateur-built aircraft accidents, with 407 fatalities. Over half of these accidents (972) occurred within the first 40 hours of the flight test phase, accounting for 169 of the total fatalities.

A large number of these accidents are not a consequence of poor construction but resulted from an affliction known as "Get-it-up-in-the-air-itis." After endless months of painstakingly assembling materials in accordance with printed instructions, filling out appropriate forms and submitting to a required inspection, the builder/pilot feels consumed with impatience to pull the chocks, turn the switch and roar away—to FLY. He is dying to experience the beauty of flight in the machine he has created. And sometimes he does die, because he has not understood the importance of the test flight phase for amateur-built aircraft.

The purpose of this test flight period is not—initially at least—to find out how good the aircraft is, but to learn what, if anything, *is wrong with it*. It is not unlikely, inspite of the attention to plans, and the inspections and all the paperwork, that *something* has been put together incorrectly. It may or may not be possible to discover the problem by visual examination, once the aircraft is rolled out on the ramp.

But by extending the flight activity envelope gradually and cautiously, it is very likely that any significant construction mistakes will make themselves known within the first few minutes of flight. To an attentive test pilot—which the amateur builder should become (or engage)—a great deal can be learned from the sound of the engine at various rpms, the feel of the controls, the response to the throttle, and the design operational data as compared with actual performance data.

The Airport

Long before the conscientious test pilot sets foot in the cockpit there are many important details to be attended to, starting with the selection of an airport. Generous runway length and width, abundance of cleared space, rescue equipment and personnel, radio or telephones, periods of light activity and quiet winds—all these are important. It is natural to hope for the best, but necessary to be prepared for the worst possible scenario—including a fire or explosion.

If the aircraft had to be partially disassembled for transportation, it is desirable to obtain a hangar for reassembling and preparation for flight, so that you can work undisturbed. Your handwork should be checked by others in your support team; you may be more familiar with the aircraft than anyone else, but too much familiarity may interfere with your objectivity in determining airworthiness.

Engine Run-up

When everything has been checked and rechecked, it is time for the engine run-up procedures. This must be done strictly according to the engine manufacturer's instructions. The run-up should take place in an area well away from other aircraft, buildings, and people, with the aircraft tied down securely. Two other persons should be present: one with an operable fire extinguisher in hand; the other watching for leaks and parts leaving the airplane. Radio communication with your support team is a good safety precaution, when seconds may count.

Expect that the first several days of "flying" will be confined to the ground, consisting of engine run-ups and taxi runs of gradually increasing length and speed. Run the cowled engine until the oil is warm and internal expansion of parts has taken place, before attempting a full power run. Always allow a gradual cool-down period, to avoid thermal shock to the engine; and never exceed 30 seconds at full power on the ground. Check the fuel supply to the engine at full power, cruise, and idle. These checks should be made with the aircraft in the most critical flight attitude—if possible, tail low and minimum fuel. To test the accuracy of the gauges, run the engine out of gas. Record all findings and repeat all tests at least five times, making adjustments as needed.

End of a Dream

It was a dream come true—he had built his own airplane. Preflight checks showed no problems. He had run the engine on the ground approximately 13.5 hours before the first test flight took place and all went well. But now with 1.5 flight hours behind him something was going wrong on takeoff. More runway was being used than last time and the initial climb was sluggish. He decided to get the plane back to the airport as quickly and safely as possible.

At 100 feet AGL the pilot began a 180° turn to the right. At this time he first noticed that the tape covering the detach point on the right wing was coming loose. The flapping tape distracted him, and in the turn he lost sight of the airport. Unable to maintain altitude, he began searching for an emergency landing site, still keeping an eye on the unraveling tape. Abruptly he encountered a tree with his right wing. The airplane spun around 270° before coming to rest on the field below. The pilot was lucky to escape with only minor injuries, but his long cherished dream had been destroyed.

The amateur builder should develop a flight manual for the aircraft's performance, with checklists for all phases of preflight, flight, and postflight. Revisions should be anticipated as the flight tests proceed.

Ground Runs

Prior to starting taxi tests, the pilot should do a thorough preflight inspection with at least three extra sets of eyes doing the same. The pilot is then ready to check communications with the support team and the tower (if available), make certain the runway and approaches are clear, and the runway reference points are marked with colored flags (red for abort, green for lift-off, etc.). Successive taxi runs, ranging from walking speed to published or calculated lift-off speed, should be made, repeated, and adjustments made until the pilot is comfortable with the aircraft.

A tape recorder properly secured is a good way to record engine data, flight instruments readings, and problems encountered during taxi and flight tests. Instead of having to write everything down, reading aloud the airspeed, oil pressure, etc., will save time and be less distracting while in flight. It also serves as a record of unusual noises which may not act or sound right so it can be checked into later.

The goal of a first flight is to return the bird and builder intact.

The items a pilot should check during taxi tests include: ground stability or any ground looping tendencies; brake and rudder operation and "feel," cockpit visibility; pilot's ability to keep the aircraft on the centerline; gauge readings; and aileron, rudder, and elevator effectiveness from starting roll up to lift-off speed.

While doing high speed taxi runs to the point of lift-off, try momentary lift-off and practice landing roll-outs. Note airspeed indicator readings and approximate distance down the runway where lift-off occurs, also any pitch or directional stability problems after lift-off/landings.

First Flight

Finally the moment for the first flight has arrived, if the weather cooperates. Prior to first flight the pilot should brief the team members on each of their duties and ensure that an airport or local crash/rescue truck is standing by. The pilot should again perform a thorough preflight of the aircraft and review of emergency procedures. Inviting a crowd of well-wishes or other interested spectators is not a good idea. Their presence could pressure you into an ill-advised first takeoff, despite bad weather or mechanical problems.

Inform the tower or UNICOM of your homebuilt's intended movements and make certain the active runway and approaches are clear. Run the engine, perform magneto/ignition checks and check the fuel feed to the engine at high rpm. Make sure the canopy or door is securely locked and the quick release mechanism (if installed) is working.

If everything checks out, proceed to the active runway, add power smoothly, release the brakes, and maintain directional control for lift-off. For a first airborne flight plan to return to the airport after flying 30 minutes. Report by radio to your support team on all pertinent panel data and personal observations.

After landing, endeavor to restrain your excitement long enough to perform an after-landing and securing the aircraft checklist. Note and correct any handling or airworthiness problems found, and revise the checklist and flight manual if necessary.

Expanding the Envelope

During the first 10 hours of flight testing, the pilot should concentrate on the following objectives:

- Pilot proficiency (The handling characteristics may be very foreign to you).
- General shakedown of engine and airframe in various configurations.
- Survey of engine temperature and vibration variations at various rpm.
- Aircraft performance in slow to full throttle flight.
- Aircraft's takeoff and landing roll distances, lift-off speeds, best rate and angle of climb.
- The aircraft's crosswind capability.
- An inspection of the airframe and engine to determine airworthiness (100 hour type) at the completion of 10 flight hours.
- Stability tests in accordance with kit manufacturer's instructions on stability tests.

NOTE: Test pilots should take care to sort out actual problems from perceived problems, which are the result of not being aware of a homebuilt aircraft's flying characteristics, such as the increased pitch sensitivity of a short wing span.

Amateur-built aircraft must undergo an initial flight test period of at least 40 hours, unless an FAA-approved engine and propeller combination is installed—in which case the minimum test period is 25 hours. See FAA Advisory Circular 20-27C, on "Certification and Construction of Amateur-built Aircraft," available free from DOT, Utilization and Storage Section, M-443.2, Washington, DC 20590. ■

A detailed, step by step checklist for carrying out homebuilt flight testing has been assembled by Col. George Lutz (ret.) of Springfield, VA, an aeronautical engineer, flight instructor, and former Chapter president for the Amateur Experimental Aircraft Association. It is available free from your Accident Prevention Specialist at the FAA Flight Standards District Offices.

Supplying the Taylor Ranch in the River of No Return Wilderness.

INSTRUCTOR OF THE YEAR

A dedicated pilot examiner from Arizona, who owed her initiation into flying to a troublesome horse, was named the nation's Outstanding CFI of the Year for 1987—the second woman in a row to win this award.

June Beverly Bonesteel grew up in Phoenix and began a career in livestock care after completing college in 1961. She was good at handling animals—until she began having trouble with a balky quarter horse stallion. Rather than accept defeat she sought out the horse's trainers, who owned a flying school as well as a ranch in Albuquerque. In the course of her visit she was given her first flight in an airplane.

The experience led to an abrupt career shift; within a few years she had her CFI certificate and in 1967 opened her own flight school—June's Aviation—in Deer Valley, AZ. Currently she operates out of Scottsdale Airport.

If there is one word which characterizes June Bonesteel as an instructor it is *thorough*. Her knowledge of flying is grounded in a professional understanding of how airplanes are put together as well as what makes them fly. She holds an A & P certificate, with inspector authorization, and has an ATP certificate for single and multi-engine aircraft. Other certificates include rotorcraft and helicopter, Gold Seal Instructor and ATP Designated Pilot Examiner.

After 20 years of teaching (over 7,000 hours of instruction and nearly 10,000 hours overall) June still finds her job absorbing and satisfying.

TECHNICIAN OF THE YEAR

If you have ever flown into the River of No Return Wilderness Area of central Idaho you know the importance of a healthy airplane. The area is ruggedly mountainous and very sparsely peopled—even radio contact with the "Outside" can be blocked out. The "work horse" for supply pilots is a heavy, single engine often crammed to capacity with supplies. The "airports" may be little more than a crease in the grass, in a steeply walled canyon.

The man that many of the wilderness pilots depend upon for the maintenance of their aircraft is Lenny Skunberg, proprietor of Lenny's Airmotive at the Salmon (ID) airport. A Minnesota farm boy with an interest in machinery, Lenny migrated west, earned his A & P certificates and IA rating as well as a pilot certificate, and settled in Salmon in 1977. His experience ranges from dope and fabric coverings to high performance turbo-charged engines. He has a reputation for spotting minute cracks, improper parts and incorrect installations.

Managing a repair station on the edge of the largest Wilderness Area in the U.S. is not financially enriching, but Lenny finds great satisfaction in the way pilots near and far rely on him for dependable aircraft performance. It's nice to be needed—and to be rated the Outstanding Maintenance Technician of the Year Award for 1987.

Their official awards were presented to June Bonesteel and Lenny Skunberg in Washington, D.C. on October 14, by Allan McArtor, FAA Administrator.

FAA WRITTEN EXAMINATION USE OF CALCULATOR CLARIFIED

FAA has issued a list of hand-held computers designed expressly for aviation which airmen taking written examinations may use: "Navigator," "Explorer," "Navtronic 16," and "Navtronic 1701" (Specialized Electronics Corp.); "Avstar" and "Prostar" (Jeppesen/Sanderson); and "CX-1 Pathfinder" (ASA).

Other small electronic calculators are admissible if only simple mathematical functions are performed (including square root, percentage, or one number retrieval from memory).

The agency is currently revising the existing Advisory Circular on this subject, A.C. 60–11A.

NINE NEW TCA's PROPOSED

The FAA has proposed another 9 sites to be added to the list of 23 Terminal Control Areas. The airports are: Dulles International VA, Baltimore-Washington International, Charlotte-Douglas, Orlando, Tampa, Salt Lake City, Houston Hobby, Memphis, and Phoenix.

The proposed is designed to reduce potential conflicts at these locations by requiring special procedures and equipment. Mode "C" transponders will be required at all TCA's effective December 1, 1987.

Notices of proposed rulemaking will be issued for each of the new TCA sites, and public discussions will be held locally.

LATEST FAA PUBLICATIONS

Aircraft Fuel at Airport

A change has been made to Advisory Circular 150/5230–4, "Aircraft Fuel Storage, Handling, and Dispensing on Airports." Appendix 7 has been added, providing minimum standards guidance for all phases of fuel storage, handling, and dispensing on airports. The circular is free from the DOT, Utilization and Storage Section, M–443.2, Washington, DC 20590.

New Advisory Circulars

Several new free advisory circulars may be of interest to aircraft owners and operators. One, AC 120–46, "Use of Advanced Training Devices (Airplane Only)," provides guidance for showing compliance with rules for the use of advanced training devices in FAR Part 135 training.

Another new advisory circular, AC 120–47, "Survival Equipment for Use in Overwater Operations," contains information on the survival items that should be carried on board transport aircraft in extended overwater operations. These AC's are free from the above DOT address.

• Backseater

Could a flight instructor, fully qualified but without a current medical, give instrument flight instruction to a pilot under a hood if the instructor is sitting in a backseat and a safety pilot, fully qualified to act as PIC in the aircraft, is sitting in the righthand front seat?

Gregory Gorak
Milwaukee, WI

The regulations do not specifically state that a CFI must be seated at the controls of an aircraft while giving flight instruction. Thus a non-medically current CFI who is otherwise qualified is not prohibited from giving instrument instruction from other than a control seat in an aircraft.

However, the FAA does not advocate this practice because of the obvious safety implications. In our view, the CFI should have full and immediate access to all operable flight controls when giving flight instruction. Only in this way can the CFI ensure that the safety of the flight is not compromised.

• Detonation Damage

Talking about mixing up gasoline and kerosene, you might like to know that oldtime tractors (pre-1930) often were made to run on kerosene after being started on gasoline. Look at some tractors in museums and you will see they have a large tank for the kerosene and a small, oval tank for gas. The tractor was started and warmed up on gas, then switched to kerosene. These tractors had low-compression engines—in the range of four to one.

The higher compression of airplane engines causes kerosene to detonate—explode—causing melted piston heads, blown cylinder heads, all kinds of problems. It would be good if FAA could produce a film such as we had in WW-II to show what detonation is and what it can do to an engine. Gasoline will also detonate if the octane rating is much lower than the fuel it is designed for.

James Jackson
Carlisle, IN

Thank you for the historical note. Your last point, on low-octane gasolines, is also well taken; detonation is not always audible in an airplane. The harm it causes while not immediately apparent, if allowed to continue, will accumulate until serious engine problems appear, such as a catastrophic failure or an expensive overhaul.

• Position Lights

FAR§91.73 states that from sunset to sunrise an aircraft may not be operated unless it has lighted position lights. FAR §91.33(c) states that for night flight approved position lights are required. However, lights are not defined.

If the red and green wingtip navigation lights are inoperative, but the wingtip strobes on each wing are functioning, is the aircraft legal for night flight?

Cyril Toker
Potomac, MD

Negative.

Position lights, as described in FAR §23.1385, consist of approved red and green lights in a forward position at each wing tip and an approved rear position light mounted as far aft as possible on the tail or on each wing tip.

• Tallyho, No Joy

Being somewhat of a traditionalist it bothers me that "Tallyho" and "No Joy" have fallen into disuse as pilot radio terms to notify ATC of traffic insight or not in sight.

These two very short and unmistakable phrases communicate the message clearly and without possibility of confusion. Besides, it sounds kind of dashing to say "Tallyho" and in these days of microchips and plush upholstered interiors we could all use a little dash in our flying—what say?

Ed Keene
Modesto, CA

Colorful and dashing, yes, but a bit confusing to the current generation of controllers and airmen.

• Do It and Say It

Regarding the letter on confirmation of a transponder code change in your March/April issue, your response was accurate. Just thought I might add that the best way to confirm when ATC says "squawk 1, 2, 3, 4, and ident" is just do it and say nothing. The controller will see the ident and know that you have complied without tying up the frequency with an unnecessary response.

Thanks for another interesting issue.

Lonnie McLaughlin
Brentwood, NY

Air Traffic operations tells us they prefer pilot confirmation of a transponder code change, as the safest means of preventing a mix-up among the various aircraft being handled by a controller.

• Speed Abbreviations

I enjoyed reading Moving Up (FAA Aviation News, Nov/Dec 1986). Would you please define the V-speeds shown on your sample information card.

Mark R. Rojas
Elko, NV

The definitions (found in Part I of the Federal Aviation Regulations) are as follows:

V_{no} —Maximum structural cruising speed
V_{so} —Stalling speed
V_r —Rotation speed
V_{lof} —lift-off speed
V_x —best angle of climb
V_y —best rate of climb
V_{le} —maximum speed with landing gear extended
V_{lo} —maximum landing gear operating speed
V_{fe} —maximum flap extended speed

FAA AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA AVIATION NEWS, AFS-810, Washington, D.C. 20591.

• Low and Slow

I've been wondering about the safety of some banner-towing operations. The pilot has to come in low and slow to pick up the banner and cable assembly and that alone can be tricky. After the connection is made, the aircraft slows a lot more because of the tremendous drag. What if it stalled and dived into the ground? The banner team is standing by, but what if the aircraft doors are jammed in a crash and a fire starts from fuel spill—they often operate from open fields. The nearest hangar or supply source could be a mile away: how could anyone get the pilot out?

Are there any rules about standby fire extinguishers?

Dave Schramm
Mustang, OK

Banner towing operations require a waiver from the Flight Standards District Office. The FAA safety inspector involved will usually visit the site or otherwise ascertain that reasonable precautions have been taken by the pilot and the team, before issuing such a waiver.

We appreciate your concern and the trouble you took to write us about it.

• CFI Without a Medical

In the May/June 1987 Forum you indicated that a flight instructor with an expired medical could not give instrument flight instruction to an instrument-rated, fully qualified pilot in IMC or on an IFR flight plan. It would seem to me that this would be one of the few times this flight instructor could indeed give instruction—not so?

Gregory Gorak
Milwaukee, WI

There was a typographic error in our reply to the letter you refer to (CFI Without a Medical?). The final paragraph should have read: "Accordingly, a CFI who does not hold a current medical certificate, but is not acting as PIC as a required flight crewmember, may give creditable flight instruction to a pilot who is fully qualified and currently rated to act as PIC for the aircraft. A non-medically current CFI is NOT permitted to give flight instruction to a student pilot; to a pilot whose BFR has lapsed or who is otherwise not qualified, rated and current in the aircraft; to a non-instrument rated pilot in IMC or on an instrument flight plan; or to a pilot practicing instrument flight under a hood (which requires the presence of a safety pilot)."

Thank you for calling the error to our attention.

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Famous Flyers *(continued from p. 11)*

States, but the strike had spread to Canada while the ship was still en route.

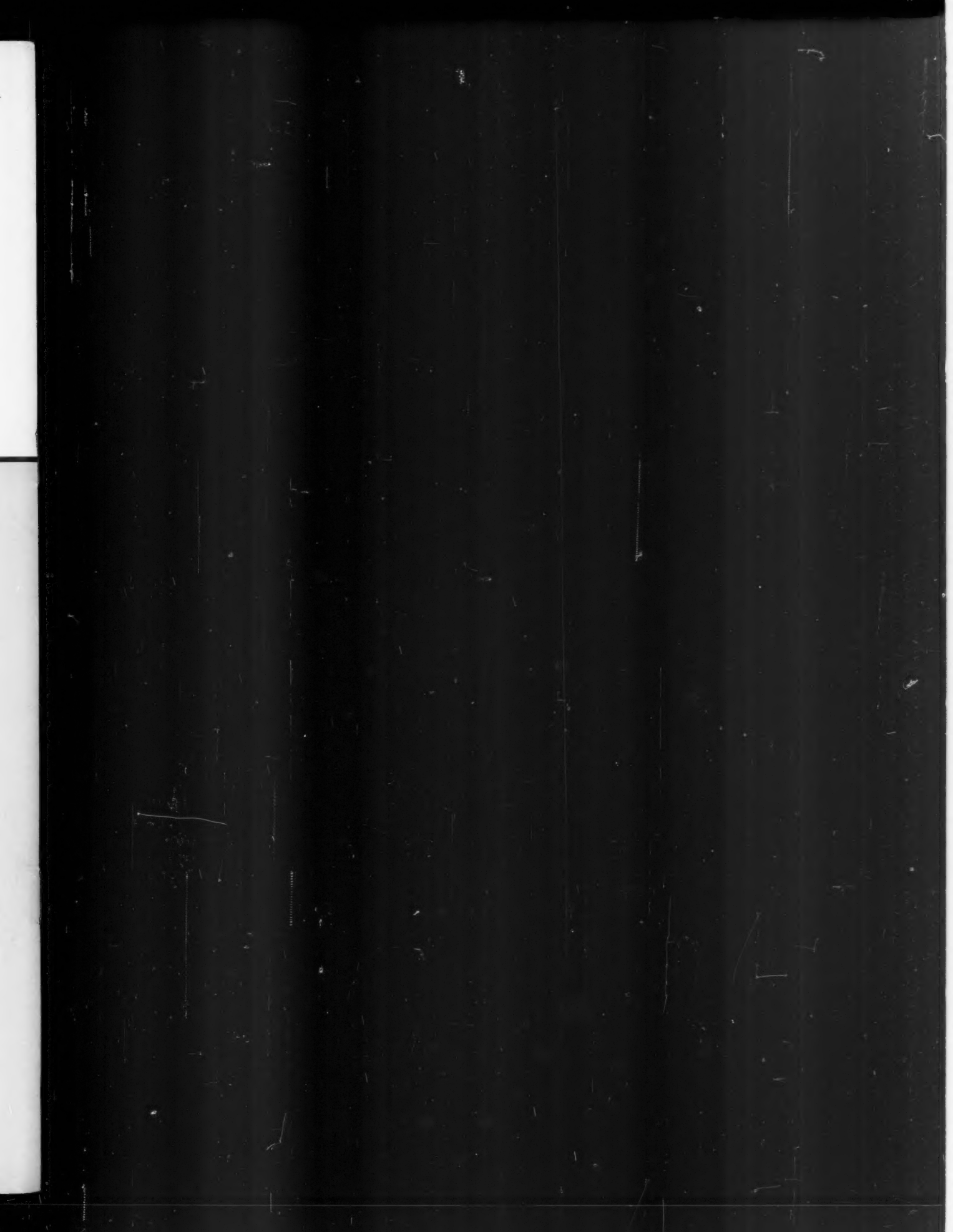
When Garber was notified that the *Flyer* could not be unloaded, he hurried up to Halifax. Once there he told them he was a U.S. Navy officer (he was albeit retired) and that the shipment contained a national treasure: therefore unloading it was imperative. Put that way, the ship's captain agreed. In the meantime, Garber contacted his former Naval commander and told him he needed a transport ship. One week later all arrangements were made and the *Flyer* was on its way to DC, courtesy of the U.S. Navy.

At the time there was no specific Smithsonian building expressly for aviation. The *Spirit of St. Louis* and the Wright *Flyer* shared space with other exhibits at the Arts and Industry Building. The majority of the aeronautical collection, while awaiting restoration and exhibition, was being stored in a Government warehouse in Park Ridge, IL. However, with the outbreak of the Korean Conflict, the storage area was needed for other purposes and Garber started looking for a site closer to home. The search ended a few miles southeast of DC with the acquisition of 21 acres in Suitland, MD. Garber used his military connections to persuade the Army Corps of Engineers that the site was perfect for "bulldozer training," thus eliminating trees and other obstacles to construction in a hurry.

With the erection of hangar-like buildings, the site was ready for storing the nation's aeronautical treasures, which included the Curtiss NC-4 (first to cross Atlantic), Fokker T-2 (first nonstop flight across the U.S.), Douglas World Cruiser "Chicago" (first round-the-world flight), and Lincoln Ellsworth's Northrop Gamma "Polar Star" (first flight across the Antarctic). Today the collection numbers over 300 aircraft.

Civil Service retirement rules forced Paul Garber to retire in 1969, but that does not mean he has stopped working. He was named Historian Emeritus, and to this day still averages 40 hours a week of volunteer work with the museum. His long time fascination with kites is still in evidence, as he has been the guiding force and master of ceremonies of the Smithsonian's annual Kite Festival since it began in 1966.

His vision of a Smithsonian museum dedicated entirely to aviation came true in 1976 when the Air and Space Museum was opened—and quickly became the most popular museum in the world. The preservation, restoration, and storage site in Suitland (known then as the Silver Hill Facility) was expanded and in 1980 was renamed the Paul E. Garber Facility in honor of Garber's 60th year with the Smithsonian.

Garber's many other honors include doctoral degrees from the University of Dayton, OH, and from Salem College, WV; the 1959 Frank G. Brewer Trophy for aviation education; the Smithsonian's Gold Medal for Exceptional Service; also awards from Brazil, Italy, France and other foreign nations.

Even now in his 88th year he is still an active and integral part of the National Air and Space Museum. Because of his experiences with aviation pioneers, beginning with the Wright brothers, he is much in demand as a speaker. His speaking engagements have been reduced, however, as the Smithsonian wants him to concentrate on writing about the era of aviation. He not only knows its history; he also lived it. ■